FACT SHEET FOR RECLAIMED WATER PERMIT ST 6039
NORTH BAY/CASE INLET

Serving the
Town of Allyn, Victor, and Lakeland Village

SUMMARY

The North Bay/Case Inlet sewage treatment system and Water Reclamation Facility (WRF) is new. Previously there were onsite septic systems serving this area which had a high rate of failure and fecal contamination of North Bay. The fecal contamination resulted in the state Department of Health closing the bay to shellfish harvest. The new treatment system collects waste water from homes and businesses in the Town of Allyn, Victor and Lakeland Village. The treatment system is an activated sludge plant using sequencing batch reactors, followed by chemical addition, mixing, filtration, UV disinfection, storage and land application. With the addition of the coagulation and filtration the plant qualifies as tertiary treatment. The treated effluent will meet or exceed Class "A" Reclamation and Reuse Final Standards and will be sprayed on forest lands at an application rate of less than five inches per week per zone or stored in the Class "A" storage pond.

TABLE OF CONTENTS

INTRODUCTION

This fact sheet is a companion document to the draft State Waste Discharge Permit No. ST 6039. The Department of Ecology (Department) is proposing to issue this permit, which will allow the beneficial use of reclaimed water. This fact sheet explains the nature of the proposed discharge, the Department's decisions on limiting the pollutants in the wastewater, and the regulatory and technical bases for those decisions.

The Reclaimed Water Act, Chapter 90.46 Revised Code of Washington (RCW), authorized the development of Water Reclamation and Reuse Standards for the beneficial use of reclaimed water. These standards were completed in 1997. All reclaimed water permits issued by the Department must specify conditions demonstrating that the wastewater has been adequately and reliably treated to meet the requirements in the Water Reclamation and Reuse Standards appropriate for the use. In addition to meeting the effluent limitations, the standards require specific treatment and disinfection requirements beyond those of most conventional wastewater treatment facilities. The standards also require automated alarms, redundancy of treatment units, emergency storage, stringent operator training requirements and public notification of reclaimed water use.

Washington State law (RCW 90.48.080 and 90.48.162) requires that a permit be issued before discharge of wastewater to waters of the state is allowed. RCW 90.46.040 requires the Department to issue a permit for land application of reclaimed water. RCW 90.46.030 states that the Department of Health may issue a permit for industrial and commercial uses of reclaimed water. Per memorandum of agreement between the Departments of Ecology and Health, the DOH requirements are included in a single permit issued by the Department. Per RCW 90.46.040, the permit is issued to the generator of the reclaimed water who may then distribute the water subject to the permitted provisions governing the location, rate, water quality and purposes of use.

Washington State law (RCW 90.48.080 and 90.48.162) requires that a permit be issued before discharge of wastewater to waters of the state is allowed. Regulations adopted by the state include procedures for issuing permits [Chapter 173-216 Washington Administrative Code (WAC)], technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC) and water quality criteria for ground waters (Chapter 173-200 WAC). They also establish the basis for effluent limitations and other requirements which are to be included in the permit.

This fact sheet and draft permit are available for review by interested persons as described in Appendix A--Public Involvement Information.

The fact sheet and draft permit have been reviewed by the Southwest Regional Office of the Washington State Department of Ecology, The Department of Health and by the Permittee. Errors and omissions identified in these reviews have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Changes to the permit will be addressed in Appendix D--Response to Comments

GENERAL INFORMATION	
Applicant	Mason County
Facility Name and Address	North Bay / Case Inlet WRF 1001 Reclamation Ridge Road

GENERAL INFORMATION		
Type of Treatment System	Activated sludge with filtration tertiary treatment, UV disinfection, storage. Beneficial uses include land application and ground water charge via surface percolation.	
Legal Description of Application Area	WRF and Storage Ponds: S 19, T 22N, R 1W Latitude: 47° 22' 40" N. Longitude: 122° 51' 42" W.	Discharge Sprayfield: S25, T22N, R 2W Latitude: 47° 22' 21" N Longitude: 122° 52' 16" W.
Contact at Facility	Name: Steve Cole Telephone: (360) 426-5596	Name: Tom Moore Telephone: (360) 427-7771
Responsible Official	Name: Gary Yando Title: Director of Utilities and Waste Management Address: Mason County Telephone #: (360) 427-9670 FAX # (360) 427-7772	

BACKGROUND INFORMATION

DESCRIPTION OF THE COLLECTION AND TREATMENT SYSTEM

HISTORY

The area of North Bay from Victor on the east side of the bay around to the Town of Allyn on the west, along Sherwood Creek, and down North Bay to Grape View has a history of failing septic systems. Sanitary surveys and comprehensive on-site inspections in the mid to late 1980s showed a high rate of failure of the on-site sewage systems. The failing on-site systems were attributed to poor soils and high ground water unsuitable for septic drainfield function. In 1988 the state Department of Health downgraded the status of North Bay prohibiting shellfish harvesting due to fecal contamination in the waters of the Bay. In 1993, the Department issued a consent order to correct the threats to water quality. These actions prompted Mason County to pursue a new collection and treatment system for the area.

In 1994 Gray & Osborne prepared the *North Bay/Case Inlet Wastewater Facility Plan*. The plan received final approval from the Department and includes a collection system and tertiary treatment facility that will meet Class "A" reclaimed water standards as defined by RCW 90.46. Several volumes of reports and amendments to the plan are dated up to 1999. The publicly owned treatment works (POTW) began collecting waste water and providing treatment in the fall of 2001 under a temporary permit from the Department.

The POTW as built includes:

- A collection system to serve a population of 3,575 and approximately 25.5 miles of sewer pipe;
- Four pump stations: two transmission stations and two collection system pump stations;
- Two sequencing batch reactors followed by chemical addition, coagulation and filtration;
- UV disinfection;
- An emergency overflow basin;
- A holding/infiltration basin; and
- A sprayfield for land application of reclaimed water.

COLLECTION SYSTEM STATUS

Lakeland Village—This area is served by a gravity and low pressure system totaling approximately 11.8 miles of two-inch through eight-inch HDPE and PVC pipe. Grinder pumps are required at many of the homes to pump the sewage up to the sewer lines.

Three pump stations serve the Lakeland village area.

North Bay/Case Inlet including the Town of Allyn and Victor area—This area is served with pump stations, force mains, pressure and gravity sewers. Grinder pumps are required at many of the shoreline homes to pump the sewage up to the sewer lines. There is approximately 13.7 miles of two-inch through eight-inch HDPE and PVC pipe. There are three pump stations in this area and two more pumps that lift the sewage up 320 feet in elevation in two lifts up to the treatment plant.

TREATMENT PROCESSES

Because the reclaimed water is discharged to the ground, the treatment system needs to have testing to assure that the groundwater is protected. The POTW has requested to become a water reclamation facility (WRF) that will treat to Class A reclaimed water standards.

The pumped flow from the collection system enters the headworks which contains a mechanically cleaned fine screen, dual-sided gravity grit channel, and a Parshall flume influent flow meter. A manually cleaned bar screen may be used to screen high flows of effluent that may need to go to a lined by-pass basin. Effluent from the by-pass basin can be pumped back to the headworks.

Flow from the headworks is gravity piped to a pair of sequencing batch reactors that alternate with automatic valves. The liquid in the reactor basins is aerated by a jet aeration system powered by submersible pumps and blowers in an equipment building which supply air. Floating decanters allow each tank to be alternately decanted to equalization basins. Submersible pumps transfer the secondary effluent from the equalization basins to filtration units. Chemical coagulation is required to meet Class A reclaimed water standards.

The flow is filtered by one of two filtration units. Turbidity of the effluent is continually monitored prior to flow entering an ultraviolet (UV) disinfection system.

The system will be operated by any one of four operators that operate this and two other plants in Mason County. The operators are classified as Group I through III. The plant will be operated from 9:00 a.m. through 3:30 p.m. One operator will staff the plant on weekends.

The plant is classified as a tertiary Class III plant which requires an operator at the Group III level.

The project was funded by grants and loans from the Department and the U.S. Department of Agriculture under a rural development grant and loan. The funding amounts are as follows:

- Department of Ecology: $5 million in grants, $9 million in loans;
- U.S. Department of Agriculture: $3.74 million in grants, $5.2 million in loans.

There is a $2,253 hookup fee for grinder pump systems. For Lakeland Village, the hookup fee runs from $1,600 to $1,800, depending on the system. The fees at Lakeland Village are proposed to increase to $2,253 as well in the near future. The monthly residential fee for the sewerline is $48.50. Vacant lots are charged $15 per month.

The land where the sprayfield is located is owned by the state Department of Natural Resources. The sprayfield land is leased to Mason County for 20-years. The spray lines are located above ground so that they can be moved in the event of future logging operations.

DISTRIBUTION SYSTEM (STORAGE BASIN WITH SURFACE PERCOLATION AND FOREST SPRAYFIELDS,)

The Permittee is considered the generator of the reclaimed water and RCW 90.46.120 gives the Permittee the exclusive right to any water generated by the treatment facility. Use and distribution of reclaimed water is exempted from the water right permitting requirements of RCW 90.03.250 and 90.44.060.

The Facility Plan does not discuss the status of the water discharged to ground water via surface percolation. Mason County has stated that they desire to reserve the right to direct this reclaimed water for future beneficial uses.

The flow from the UV disinfection system is sent either to the sprayfield or to an unlined storage basin that also allows infiltration of the effluent into the ground. Effluent may be pumped to one of three

sprayfield zones totaling 18.6 acres. Each zone is 6.2 acres. The application rate is predicted to be 4.6 inches per week per zone. The operation schedule will be 12 hours per day, once every three days per zone. This schedule will allow each zone to rest two out of three days.

Shallow monitoring wells in the sprayfield will be electronically linked by computer so that the operators may monitor the groundwater level beneath the sprayfield to prevent overloading. The storage pond prior to the sprayfield is designed to hold 13 million gallons. However, the design capacity is for 28 days of plant flows plus 14 days for precipitation. The storage pond allows infiltration and is to be used during the wet months when the ground is frozen and when infiltration at the sprayfields is not possible. The land application is accomplished with sprinkler heads set in parallel lines 50 feet apart, each sprinkler with a 25-foot radius. Each sprinkler is rated at 2-20 gpm at 40 psi. Although the design rate of the sprayfield application is 4.6 inches per week in each zone, the rate can be adjusted depending on monitored ground water levels.

Public access to the sprayfield is restricted by signs around the perimeter. Each of the existing sprinkler heads are marked with a permanent label that warns not to drink the water.

The efficiency of the treatment at removing coliform bacteria prior to spraying is very high. The Class A reclaimed water standards that must be achieved do not allow the median number of total coliform organisms in any week to exceed 2.2 coliforms per 100 ml, and no single sample to exceed 23 total coliforms per 100 ml.

RESIDUAL SOLIDS

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the activated sludge (SBR) treatment and filtration, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum and screenings are drained and disposed of as solid waste at the local transfer station. Solids removed from the SBR treatment and filtration unit are treated with aerobic digestion, dewatered and land applied as biosolids under the State wide General Permit for Biosolids Handling.

GROUND WATER

The hydrology beneath the project area includes a perched shallow aquifer. The effluent will be infiltrated into the unsaturated zone and eventually into the perched aquifer. The perched aquifer is underlain by a low permeability aquitard of glacial till (hardpan). The regional water supply aquifer, underlies the aquitard. Ground water in the perched aquifer flows along the top of the aquitard which slopes generally to the south. Ground water in the regional aquifer flows to the east-southeast toward Case-Inlet. The thickness of the receiving soils vary from 2 to 10 feet thick and consist of gravelly silt and sand. Infiltration rates likely range from 1 to 20 inches per day. An average infiltration rate of 5.76 inches per day is possible at the site and an average of 1.8 inches per day was used for a design application rate. (Hong West, 1997)

Well logs on file at the Department indicate the nearest known wells to the site are greater than a half mile away. The only known well that is down gradient of the land application area is 4,500 feet away.

Existing ground water quality in the regional aquifer appears to meet state Ground Water Quality Standards and State Ground Water Recharge Criteria for all parameters.

PERMIT STATUS

This is a new facility. An application for a permit was submitted to the Department on August 15, 2001.

WASTEWATER CHARACTERIZATION

Because the facility is new and was not discharging at the time this fact sheet was written, it is assumed that the concentration of pollutants in the discharge will meet the limits expected by the Permittee's consulting engineers and the Permittee in applying for the permit.

SEPA COMPLIANCE

State Environmental Policy Act (SEPA) review was conducted on April 19, 1994. Other permits were completed as follows:

- USDA/RD Environmental Assessment: 1996
- Shoreline Conditional Use: 3/4/1999
- DNR Property Acquisition: 9/9/1999
- Army Corps Permit: 5/20/1999
- Hydraulic Project Approval: 9/8/1998
- Dam Safety Permit: 4/19/2000

PROPOSED PERMIT LIMITATIONS

State regulations require that limitations set forth in a permit issued under Chapter 90.48 RCW must be either technology- or water quality-based. Wastewater must be treated using all known, available, and reasonable treatment (AKART) and not pollute the waters of the state. The minimum requirements to demonstrate compliance with the AKART standard are derived from the *Water Reclamation and Reuse Standards*, the *Design Criteria for Municipal Wastewater Land Treatment*, and Chapter 173-221 WAC.

The permit also includes limitations on the quantity and quality of the reclaimed water land applied to the sprayfield or infiltrated to recharge groundwater via surface percolation that have been determined to protect public health and ground water quality. The Permittee chose to meet Class-A reclaimed water criteria with de-nitrification for all uses which, for irrigating trees, goes beyond the Class-D water quality required. However, Class-A quality is required for ground water recharge and fire protection, which are uses the applicant is pursuing. The approved engineering report includes specific design criteria for this facility.

Water quality-based limitations are based upon compliance with the Ground Water Recharge Criteria (RCW 90.46.080) which are the drinking water standards for the parameters noted and the Ground Water Quality Standards (Chapter 173-200 WAC) for other parameters that require regulation.

The more stringent of the water quality-based or technology-based limits are applied to each of the parameters of concern. Each of these types of limits is described in more detail below.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

All reclaimed water permits issued by the Department must specify conditions assuring that the effluent has been adequately and reliably treated, so that as a result of that treatment, it is suitable for a beneficial use or controlled use that would not otherwise occur and is no longer considered a wastewater [RCW 90.46.010(4)]. The Water Reclamation and Reuse Standards, 1997, outline the requirements for the level of treatment technology as well as water quality limits necessary for public health protection during the use of reclaimed water. The standards provide four classes of reclaimed water, Classes A, B, C, and D.

This facility produces Class A reclaimed water. Class A is the highest quality of reclaimed water and therefore provides the broadest range of reuse opportunities. Conversely, Class A reclaimed water requires the most stringent treatment and water quality limitations. The technology and water quality requirements for the production of Class A reclaimed water are as follows:

"Class A Reclaimed Water" is reclaimed water that had been adequately and reliably treated and, at a minimum is, at all times, an oxidized, coagulated, filtered and disinfected wastewater.

1. Oxidized is defined as wastewater in which the organic matter has been stabilized such that the biochemical oxygen demand (BOD_5) does not exceed 30 mg/L and total suspended solids (TSS) does not exceed 30 mg/L, is nonputrescible and contains dissolved oxygen.

2. Coagulated wastewater is defined as an oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated prior to filtration by the addition of chemicals or by an equally effective method.

3. Filtered wastewater is defined as an oxidized, coagulated wastewater which has been passed through natural undisturbed soils or filter media, such as sand or anthracite, so that the turbidity as determined by an approved laboratory method does not exceed an average operating turbidity of 2 nephelometric turbidity units (NTU), determined monthly, and does not exceed 5 NTU at any time.

4. Adequate disinfection is defined as the median number of total coliform organisms in the wastewater after disinfection does not exceed 2.2 per 100 milliliters, as determined from the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform organisms does not exceed 23 per 100 milliliters in any sample.

GROUND WATER QUALITY-BASED EFFLUENT LIMITATIONS

RCW 90.46.080 states that reclaimed water may be beneficially used for surface percolation provided that it meets the Groundwater Recharge Criteria as measured in the ground water beneath or down gradient of the recharge project site. The Groundwater Recharge Criteria are defined in 90.46.010 as the contaminant criteria found in the drinking water quality standards adopted by the state Board of Health pursuant to Chapter 43.20 RCW and the Department of Health pursuant to Chapter 70.119A RCW. The primary drinking water standards are listed in Table 1A below. Drinking water is the beneficial use generally requiring the highest quality of ground water. Providing protection to the level of drinking water standards will protect a great variety of existing and future beneficial uses.

TABLE 1A

Parameter	Primary Drinking Water Standards
Nitrate as N	10 mg/L
Nitrite as N	1 mg/L
Arsenic	10 µg/L
Cadmium	5 µg/L
Chromium	100 µg/L
Fluoride	2 mg/L
Mercury	2 µg/L
Nickel	100 µg/L
Total Trihalomethanes (TTHM)	0.10 mg/L

RCW 90.46.080 further states that if the Ground Water Recharge Criteria do not contain a standard for a constituent or a contaminant, the Department shall establish a discharge limit consistent with the goals of the Reclaimed Water Act. In order to protect existing water quality and preserve the designated beneficial uses of Washington's ground waters including the protection of human health, WAC 173-200-100 states that permits shall be conditioned in such a manner as to authorize only activities that will not cause violations of the Ground Water Quality Standards. Additional ground water criteria as defined in Chapter 173-200 WAC for this discharge include the following:

TABLE 1B

PARAMETER	ADDITIONAL GROUND WATER QUALITY CRITERIA
Total Dissolved Solids	500 mg/L
Chloride	250 mg/L
Sulfate	250 mg/L
Copper	1300 µg/L
Manganese	50 µg/L
Silver	100 µg/L
Zinc	5000 µg/L
pH	6.5 to 8.5 standard units
Total Iron	0.3 mg/L
Toxics	No toxics in toxic amounts

The Department has reviewed existing records and is unable to determine if background ground water quality is either higher or lower than the criteria given in the Ground Water Recharge Criteria or the Ground Water Quality Standards. Therefore, the Department will use the criteria expressed in the regulations in the proposed permit. The discharges authorized by this proposed permit are not expected to interfere with beneficial uses.

At the time of issuing this permit there was very little water in the monitoring wells. The winter and summer of 2001 were very dry. Only four to five rounds of sample data was available at this time (see Appendix C). The Permittee will be required to sample the wells again on a quarterly frequency. The preliminary sampling show that background ground water quality data is mostly below detection levels or the ground water quality standards for most parameters. The background parameters will be re-evaluated during the next permit cycle.

Proposed Effluent Limitations

The effluent limitations below are intended to take effect after start up of the reclamation facility when it is reasonable to expect compliance with the limitations. The following limitations are broken into two groups: effluent limitations and groundwater limitations. The effluent limitations require limits be met in the plant at the end of the secondary treatment process which is before the addition of coagulant. Some limitations are before filtration and some are required at the end of the UV disinfection, as specified in the permit. The groundwater limitations are water quality-based limits to be met at specified monitoring wells. The following limitations are from the permit.

Table 2: Effluent (Technology Based) Limitations:

EFFLUENT LIMITATIONS			
Parameter	**Average Monthly[a]** (unless otherwise noted)	**Average Weekly[b]** (unless otherwise noted)	**Location**
Flow (mgd)	0.304 mgd (avg. daily) 0.608 mgd (max daily) 0.365 mgd (max monthly)		Influent
Oxidized Wastewater			
BOD_5	15 mg/L	22 mg/L	Final Effluent[c]
TSS	15 mg/L	22 mg/L	Final Effluent[c]
Dissolved Oxygen	Shall be measurably present in effluent		Secondary Effluent[c]
Coagulated and Filtered Wastewater			
	Average Monthly[a]	**Sample Maximum[d]**	
Turbidity	2 NTU	5 NTU	Prior to disinfection
Disinfected-Reclaimed Water			
	7-day Median[e]	**Sample Maximum[d,f]**	
Total Coliform	2.2 cfu/100ml	23 cfu/100mL	Final reclaimed water
pH	Shall not be outside the range of 6-9 standard units		Final reclaimed water
Total Nitrogen as N	10 mg/L (average monthly)		Final reclaimed water
Lead		50 mg/L	Final reclaimed water

[a] The average monthly effluent limitation is defined as the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

[b]The average weekly effluent limitation is defined as the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number or daily discharges measured during that week.

[c]The sampling point for BOD_5 and TSS will be the final effluent. The sampling point for DO will be the secondary effluent.

[d]The sample maximum effluent limitation is defined as the highest allowable discharge.

[e]The median number of total coliform organisms in the reclaimed water after disinfection does not exceed 2.2 per 100 milliliters, as determined from the bacteriological results of the last seven days for which analyses have been completed.

[f]The number of total coliform organisms shall not exceed 23 per 100 milliliters in any single sample.

The limits for BOD_5 and TSS are necessary for Class A water reclamation that will be used for ground water recharge and fire suppression. The facility plan states that the treatment works will be able to achieve a higher quality than the Class A standards, e.g., BOD of 10 mg/L average monthly and 15 mg/L maximum daily. However, Gray and Osborne's engineer for the North Bay plant stated that the facility may have difficulty meeting these low values during extreme high flow periods.

The following water quality limits are to be met in the groundwater at the edge of the sprayfield. Therefore the limits must be met in the monitoring wells as follows:

Table 3: Ground Water Limits.

Parameter	**Ground Water Recharge Criteria (Sample Maximum[a])**
Nitrate as N	10 mg/L
Nitrite as N	1 mg/L
Arsenic	50 µg/L
Cadmium	5 µg/L
Chromium	100 µg/L
Mercury	2 µg/L
Nickel	100 µg/L
Total Dissolved Solids	500 mg/L
Chloride	250 mg/L
Sulfate	250 mg/L
Copper	1000 µg/L
Manganese	50 µg/L
Silver	100 µg/L
Zinc	5000 µg/L
[a]The sample maximum is the highest allowable concentration for any sample as measured in the ground water at the top of the uppermost aquifer beneath or down gradient of the infiltration site.	

No valid upgradient background data were available for fluoride, sulfate, or manganese. However, because the Permittee does not fluoridate their water or add chlorine, it is not expected that fluoride will be found in great quantities in the effluent. The Permittee is required in section S2.B of the proposed permit to collect background concentrations near the point of discharge. This background data should come from up gradient monitoring wells 2-3 and from down gradient monitoring wells 3 and 4 before the sprayfield is put to use. This information may result in a permit modification or limits in the next permit renewal.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are specified to verify that the treatment process is functioning correctly, that ground water recharge criteria are not violated, and that effluent limitations are being achieved (WAC 173-216-110).

The monitoring wells installed by the Permittee appear to be properly located in order to provide information on the background water and the water downgradient of the sprayfield. However, it may not become apparent until the first wet season if there is enough water in the wells to further characterize the groundwater conditions. Therefore, it may be necessary to install more wells if they do not produce viable samples.

INFLUENT AND EFFLUENT MONITORING

The monitoring and testing schedule is detailed in the proposed permit under Conditions S1 and S2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

GROUND WATER MONITORING

The monitoring of ground water at the site is required in accordance with the Reclaimed Water Standards, Section 1, Article 12, (n) and RCW 90.46.080.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and record keeping requirements to prevent and control waste discharges (WAC 273-216-110).

FACILITY LOADING

The design criteria for this treatment facility taken from (October 1998) engineering report prepared by Gray and Osborne, are as follows:

Daily average flow:	0.304 mgd
Monthly average flow (max. month):	0.365 mgd
Instantaneous peak flow:	1.064 mgd
BOD influent loading (Max Month*):	715 lbs/day
TSS influent loading (Max Month*):	715 lbs/day

The permit requires the Permittee to maintain adequate capacity to treat the flows and waste loading to the treatment plant (WAC 173-216-110[4]). The Permittee is required to submit an engineering report when the plant reaches 85 percent of its flow or loading capacity. For significant new discharges, the permit requires a new application and an engineering report (WAC 173-216-110[5]). *Although the facility plan called these values (BOD and TSS of 715 lbs/day) an "average load," the consultant for the facility stated that this value should be used as the maximum monthly load (Sellers, 2001).

IRRIGATION AND WATER RE-USE PLANS

The water reuse plan in S8.E and the irrigation land application in S.5.H. is required to support the engineering reports and operations and maintenance manual. These plans shall include a consideration of wastewater application at agronomic rates and should describe and evaluate various irrigation controls.

OPERATIONS AND MAINTENANCE

The proposed permit contains Condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water pollution the Permittee is required in permit condition S6. to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503. The disposal of other solid waste is under the jurisdiction of the local health district.

Requirements for monitoring sewage sludge and recordkeeping are included in this permit. This information will by used by the Department to develop or update local limits and is also required under 40 CFR 503.

PRETREATMENT

WAC 173-216-110 requires that the list of prohibitions in WAC 173-216-060 be included in the permit. If at a future time, there are industrial discharges or potentially significant discharges that can upset the POTW, the Permittee may need to conduct an industrial user survey of the dischargers to determine the extent of compliance of all industrial or commercial users of the sanitary sewer. This survey is to determine compliance with federal pretreatment regulations [40 CFR Part 403 and Sections 307(b) and 308 of the Clean Water Act], with state regulations (Chapter 90.48 RCW and Chapter 173-216 WAC), and with local ordinances.

RECLAIMED WATER USE

These permit requirements are based on the Water Reclamation and Reuse Standards. The standards contain requirements to assure that distribution and use of reclaimed water are protective of public health and the environment at all times. These include prohibitions on bypass, alarms and storage or alternative disposal of substandard water, maintenance of operational records, cross connection control, use area restrictions and enforceable contracts and a local reclaimed water use ordinance.

GENERAL CONDITIONS

General Conditions are based directly on state laws and regulations and have been standardized for all industrial waste discharge to ground water permits issued by the Department.

Condition G1 requires responsible officials or their designated representatives to sign submittals to the Department. Condition G2 requires the Permittee to allow the Department to access the treatment system, production facility, and records related to the permit. Condition G3 specifies conditions for modifying, suspending or terminating the permit. Condition G4 requires the Permittee to apply to the Department prior to increasing or varying the discharge from the levels stated in the permit application. Condition G5 requires the Permittee to submit written notice of significant increases in the amount or nature of discharges (typically new industrial discharges) into the sewer system tributary to the permitted facility. Condition G6 requires the Permittee to construct, modify, and operate the permitted facility in accordance with approved engineering documents. Condition G7 prohibits the Permittee from using the permit as a basis for violating any laws, statutes or regulations. Condition G8 requires application for permit renewal 60 days prior to the expiration of the permit. Condition G9 requires the payment of permit fees. Condition G10 describes the penalties for violating permit conditions.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, and to protect human health and the

beneficial uses of waters of the state of Washington. The Department proposes that the permit be issued for five years.

REFERENCES FOR TEXT AND APPENDICES

Faulkner, S.P., Patrick Jr., W.H., Gambrell, R.P., May-June, 1989. Field Techniques for Measuring Wetland Soil Parameters, Soil Science Society of America Journal, Vol. 53, No.3.

Hong West & Assoc. 1997. Hydrogeological Evaluation Proposed Land Application Site North Bay—Case Inlet Area. Included as Appendix B of the 1998 Amendment to the North Bay Facility Plan By Gray & Osborne.

Sellers, Harold, 2001, September 21. Consultant with Gray & Osborne for the North Bay Project. Personal communication.

Washington State Department of Ecology, 1993. Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems, Ecology Publication # 93-36. 20 pp.

Washington State Department of Ecology and Department of Health, 1997. Water Reclamation and Reuse Standards, Ecology Publication # 97-23. 73 pp.

Washington State Department of Ecology, 1996. Implementation Guidance for the Ground Water Quality Standards, Ecology Publication # 96-02.

Washington State University, November, 1981. Laboratory Procedures - Soil Testing Laboratory. 38 pp.

APPENDICES

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to issue a permit to the applicant listed on page one of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on August 23, 2001, and August 30, 2001, in the *Shelton/Mason County Journal* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department published a Public Notice of Draft (PNOD) on July 25, 2002, in the *Shelton/Mason County Journal* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Administrator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30-day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-216-100). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing.

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6554, or by writing to the address listed above.

This permit was written by Eric Schlorff.

APPENDIX B--GLOSSARY

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation--The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of the collection or treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring –Uninterrupted, unless otherwise noted in the permit.

Distribution Uniformity--The uniformity of infiltration (or application in the case of sprinkle or trickle irrigation) throughout the field expressed as a percent relating to the average depth infiltrated in the lowest one-quarter of the area to the average depth of water infiltrated.

Engineering Report--A document, signed by a professional licensed engineer, which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Soil Scientist--An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5,3,or 1 years, respectively, of professional experience working in the area of agronomy, crops, or soils.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Coliform Bacteria--A microbiological test which detects and enumerates the total coliform group of bacteria in water samples.

Total Dissolved Solids--That portion of total solids in water or wastewater that passes through a specific filter.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent pollution of the receiving water.

APPENDIX C--TECHNICAL CALCULATIONS, MAPS AND SCHEMATICS

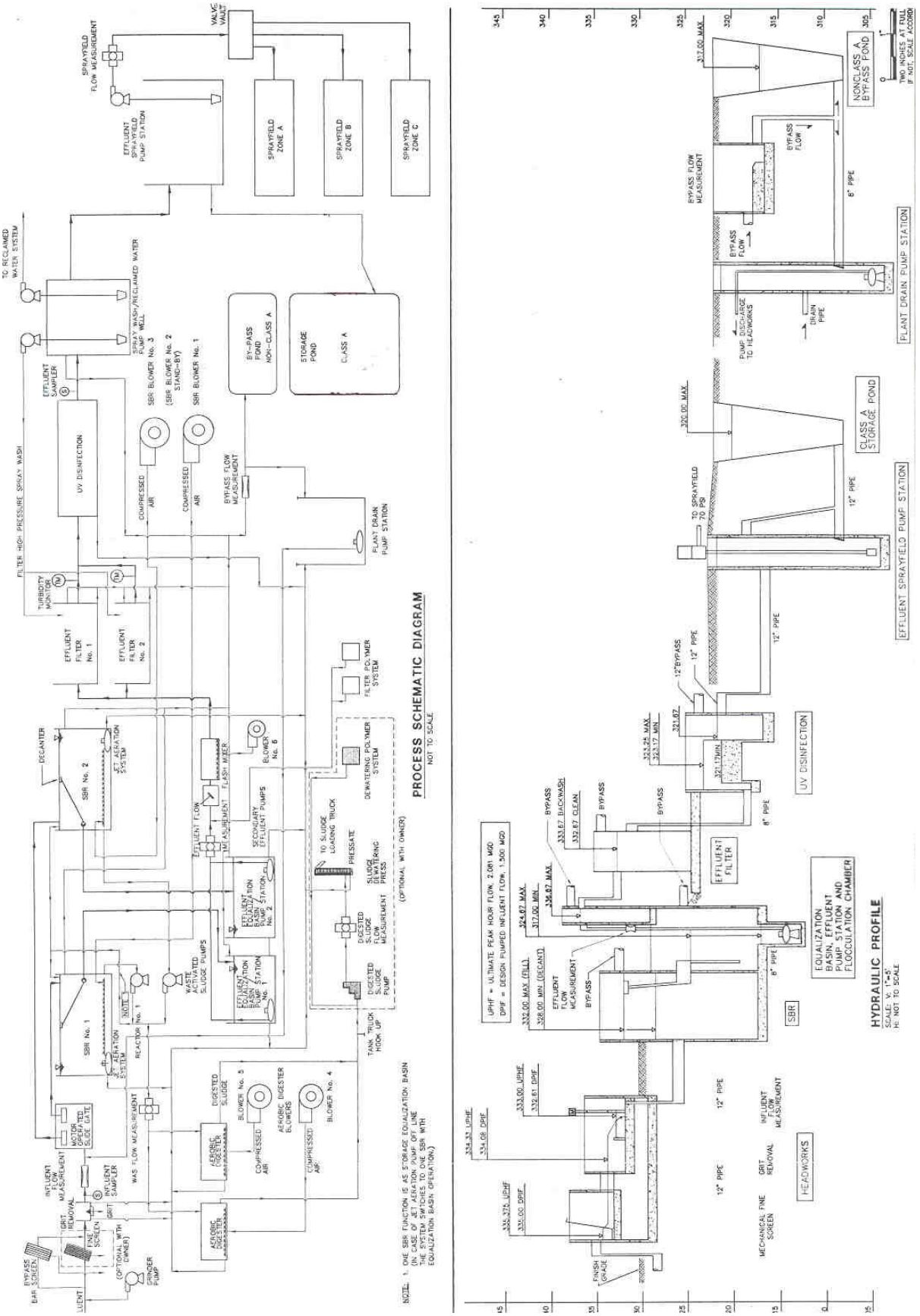
For additional technical information on the plant design and hydrology of the site, please refer to the October 1998 amendment to the North Bay Wastewater Facility Plan.

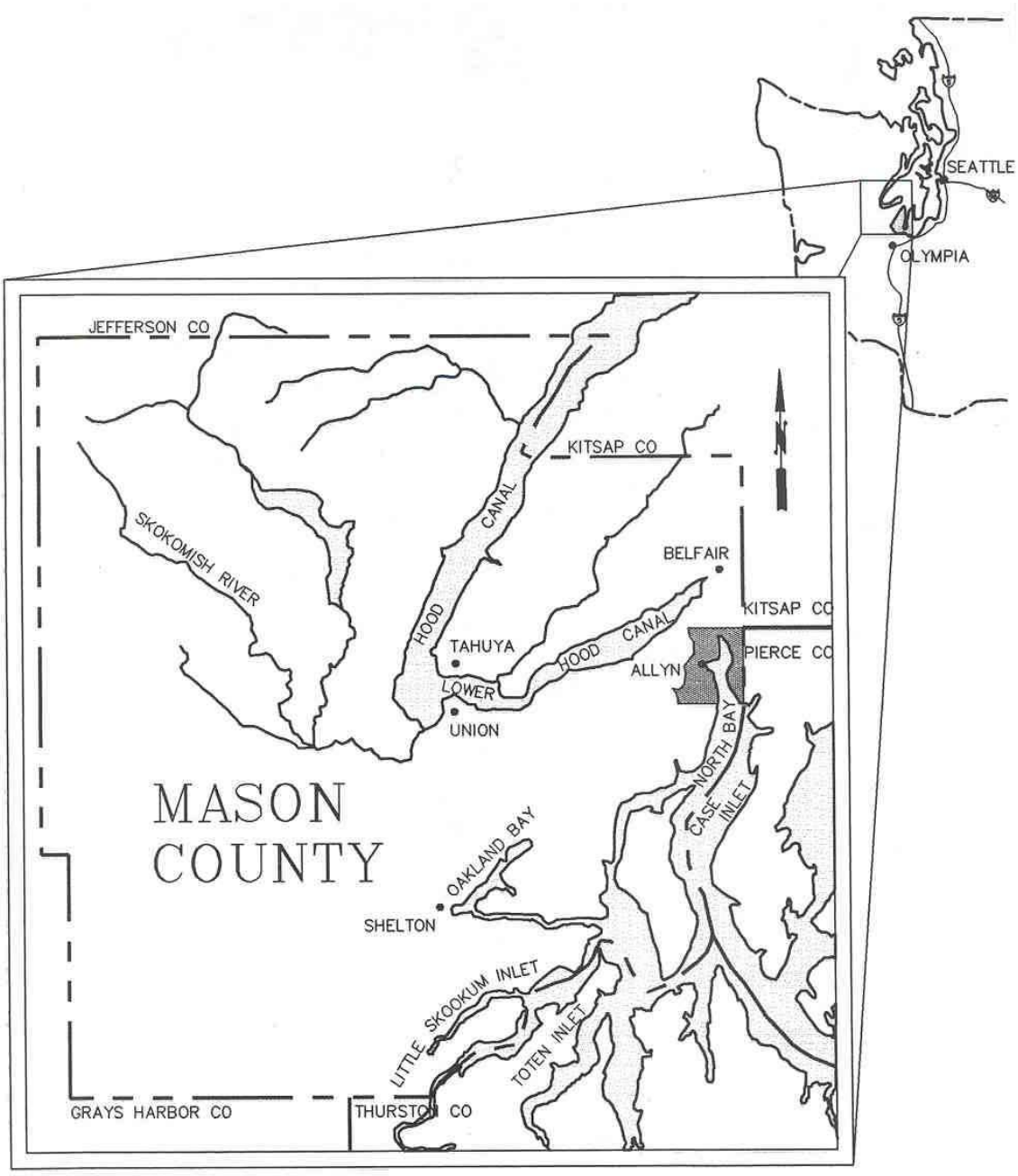
Ground Water Monitoring Well Data

Parameter	MW-3 5/17/01 mg/l	MW-3 2/22/01 mg/l	MW-3 5/18/01 mg/l	MW-1 5/17/01 mg/l	MW-1 2/22/01 mg/l	Creek 5/17/01 mg/l
Ammonia	ND	ND	ND	ND	ND	ND
Nitrate+ Nitrite	0.258	ND	ND	ND	ND	0.246
Ortho-P	0.343	0.217	ND	0.962	2.25	0.00969
Arsenic	0.0229	0.00120	0.00840	0.00840	0.00414	ND
Cadmium	ND	ND	ND	.121	ND	ND
Chromium	0.0441	0.0260	0.121	0.0597	0.0862	ND
Copper	0.0220	0.0114	0.0597	ND	0.0492	ND
Lead	0.0985	0.0257	0.0215	0.0215	0.194	ND
Mercury	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	0.0010	ND	ND
Zinc	0.0513	0.0305	0.0907	0.0907	0.0851	ND
Nickel	0.0338	0.0186	0.128	0.128	0.102	ND

ND = Non-detect or below detection level

Parameter	MW-3 5/29/97 mg/L	MW-2 5/29/97 mg/L	MW-1 6/5/97 mg/L
Total coliform	1600 (MPN/100 ml)	4 (MPN/100 ml)	7 (MPN/100 ml)
Fecal coliform	2 (MPN/100 ml)	ND (MPN/100 ml)	ND (MPN/100 ml)
Phosphorus	0.00628	0.0164	0.0050
Nitrate	0.0177	0.0478	0.0312
pH	7.6 (S.U.)	6.3 (S.U.)	6.7 (S.U.)
Antimony	ND	ND	ND
Berillium	ND	ND	ND
Arsenic	0.0229	0.00840	ND
Cadmium	ND	ND	ND
Chromium	0.0419	ND	0.0325
Copper	0.0408	ND	ND
Lead	0.0177	ND	0.0057
Mercury	ND	ND	ND
Silver	ND	ND	ND
Zinc	0.0643	ND	0.0410
Nickel	0.783	ND	0.0344
Thallium	ND	ND	ND
Selenium	ND	ND	ND

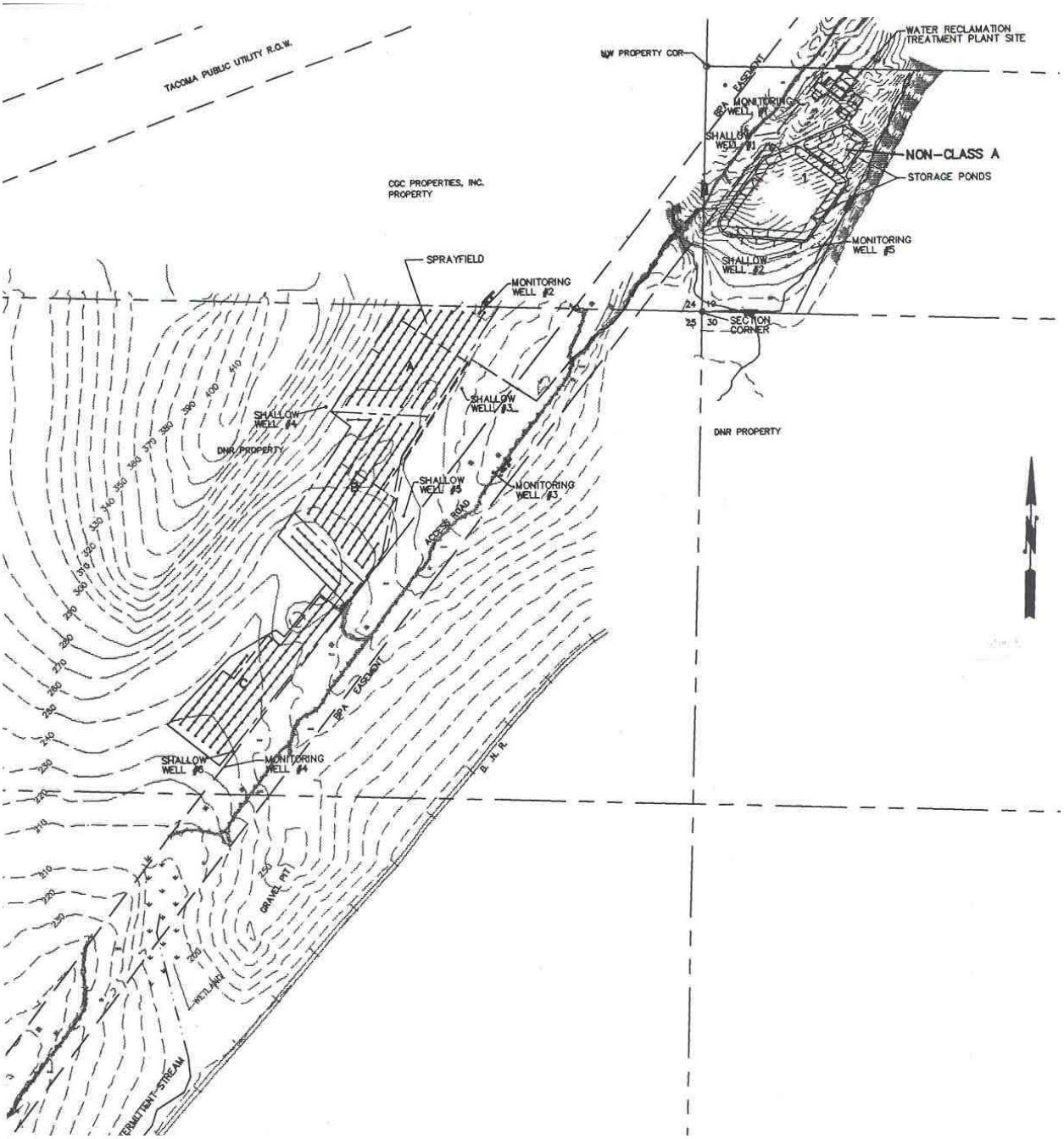

PROCESS SCHEMATIC DIAGRAM
NOT TO SCALE
HYDRAULIC PROFILE
SCALE: V. 1"=5'
H. NOT TO SCALE
SPRAYFIELD ZONE A
SPRAYFIELD ZONE B
SPRAYFIELD ZONE C
EFFLUENT SPRAYFIELD PUMP STATION
SPRAYFIELD FLOW MEASUREMENT
VALVE VAULT
TO RECLAIMED WATER SYSTEM
SPRAY WASH/RECLAIMED WATER PUMP WELL
BY-PASS POND NON-CLASS A
STORAGE POND CLASS A
SBR BLOWER No. 2 (SBR BLOWER No. 2 STAND-BY)
SBR BLOWER No. 1
EFFLUENT SAMPLER
UV DISINFECTION
COMPRESSED AIR
BYPASS FLOW MEASUREMENT
PLANT DRAIN PUMP STATION
FILTER HIGH PRESSURE SPRAY WASH
TURBIDITY MONITOR
EFFLUENT FILTER No. 1
EFFLUENT FILTER No. 2
FILTER POLYMER SYSTEM
DECANTER
SBR No. 2
AIR ASSIATION SYSTEM
FLASH MIXER
BLOWER No. 6
SECONDARY EFFLUENT PUMPS
TO SLUDGE LOADING TRUCK
DEWATERING POLYMER SYSTEM
EFFLUENT FLOW MEASUREMENT
EFFLUENT EQUALIZATION BASIN PUMP STATION No. 2
EFFLUENT EQUALIZATION BASIN PUMP STATION No. 1
PRESSATE
SLUDGE DEWATERING PRESS
(OPTIONAL WITH OWNER)
DIGESTED SLUDGE FLOW MEASUREMENT
DIGESTED SLUDGE PUMP
WASTE ACTIVATED SLUDGE PUMPS
SBR No. 1
REACTOR No. 1
TANK TRUCK HOOK UP
MOTOR OPERATED SLIDE GATE
INFLUENT FLOW MEASUREMENT
GRIT REMOVAL
FINE SCREEN
WAS FLOW MEASUREMENT
AEROBIC DIGESTER
DIGESTED SLUDGE
AEROBIC DIGESTER BLOWERS
BLOWER No. 5
BLOWER No. 4
COMPRESSED AIR
BYPASS BAR SCREEN
INFLUENT PUMPS
(OPTIONAL WITH OWNER)
NOTE: 1. ONE SBR FUNCTION AS A STORAGE EQUALIZATION BASIN DURING PEAK FLOW PERIODS. TO DO THIS THE SYSTEM SWITCHES TO ONE SBR WITH EQUALIZATION BASIN OPERATION.)
UPHF = ULTIMATE PEAK HOUR FLOW, 2.081 MGD
DPHF = DESIGN PUMPED INFLUENT FLOW, 1.500 MGD
NONCLASS A BYPASS POND
BYPASS FLOW MEASUREMENT
BYPASS FLOW
6" PIPE
PUMP DISCHARGE TO HEADWORKS
DRAIN PIPE
PLANT DRAIN PUMP STATION
320.00 MAX
TO SPRAYFIELD 70 PSI
CLASS A STORAGE POND
12" PIPE
EFFLUENT SPRAYFIELD PUMP STATION
12"BYPASS
321.67
323.25 MAX
323.17 MIN
321.17MIN
UV DISINFECTION
8" PIPE
EFFLUENT FILTER
BYPASS
333.67 BACKWASH
332.67 CLEAN
324.67 MAX
317.00 MIN
336.67 MAX
332.00 MAX (FILL)
328.00 MIN (DECANT)
EFFLUENT FLOW MEASUREMENT
EQUALIZATION BASIN, EFFLUENT PUMP STATION AND FLOCCULATION CHAMBER
SBR
334.33 UPHF
334.08 DPHF
333.00 UPHF
332.61 DPHF
335.325 UPHF
335.00 DPHF
INFLUENT FLOW MEASUREMENT
GRIT REMOVAL
MECHANICAL FINE SCREEN
HEADWORKS
FINISH GRADE
TWO INCHES AT FULL IF NOT, SCALE ACCORDI



NORTH BAY/CASE INLET PROJECT AREA

MASON COUNTY
JARPA AND MASON COUNTY SHORELINES PERMITS
FIGURE 1: VICINITY MAP

Gray & Osborne, Inc.
CONSULTING ENGINEERS


TACOMA PUBLIC UTILITY R.O.W.
NW PROPERTY COR
WATER RECLAMATION TREATMENT PLANT SITE
BPA EASEMENT
MONITORING WELL #1
SHALLOW WELL #1
NON-CLASS A
STORAGE PONDS
COC PROPERTIES, INC. PROPERTY
SPRAYFIELD
MONITORING WELL #2
MONITORING WELL #5
SHALLOW WELL #2
24
19
25
30
SECTION CORNER
SHALLOW WELL #4
SHALLOW WELL #3
DNR PROPERTY
DNR PROPERTY
SHALLOW WELL #5
MONITORING WELL #3
ACCESS ROAD
BPA EASEMENT
SHALLOW WELL #6
MONITORING WELL #4
E.H.W.
GRAVEL PIT
WETLAND
INTERMITTENT STREAM

APPENDIX D--RESPONSE TO COMMENTS

Mason County (the Permittee) commented on August 19 on discrepancies in the permit and fact sheet that were intended to be taken care of in a previous draft. Following is their comment:

> Prior to issuance of this document we had the opportunity to meet with representatives from Ecology regarding its contents. A number of issues were discussed. One of the issues related to the requirement for a 0.5 mg/L chlorine residual which remains in the permit on Page 6 of 25. It appears, however, that it was Ecology's intent to remove this requirement. Item 5 on Page 7 of the Fact Sheet, which in the earlier version of the permit required a chlorine residual, has been removed. Also, on Page 9 of the Fact Sheet, the requirement is included in the table but the footnote has been deleted. As part of the previous discussion this requirement was to be deleted in its entirety. I respectfully request that steps be taken to eliminate any reference to the chlorine residual because of the previous agreement to do so.

The chlorine residual as applied to the sprayfield distribution system and footnotes to it were removed from the permit and fact sheet as requested.